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GOVERNMENT OF INDIA
MINISTRY OF DEFENCE
(DGQA ORGANISATION)

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dt. 10 July '06

SPECIFICATION FOR WINDER TAPE, 1A

(DS CAT/PART NO.W8/1095-000545)

ISSUED BY

CONTROLLERATE OF QUALITY ASSURANCE (ENGG EQPT)
DEPARTMENT OF DEFENCE PRODUCTION AND SUPPLIES

MINISTRY OF DEFENCE

AUNDH CAMP, PUNE-411 027

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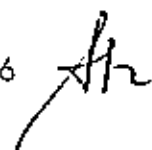
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DEFENCE SPECIFICATION FORWINDER TAPE, 1A0. FOREWORD

0.1 This specification containing 25 pages is the property of Government of India and is to be returned to Controller, Controllerate of Quality Assurance Engineering Equipment, Aundh Camp, Pune-411 027.

0.2 This specification is liable to amendment at any time and therefore is applicable only to specific enquiry made at that time or any subsequent enquiries, a fresh/new copy of the specification to be obtained. This specification supersedes earlier specification No IND/ENG/PROV/1202/c.

0.3 The Controller, Controllerate of Quality Assurance Engg Equipment, Aundh Camp, Pune-411 027 is the Authority Holding Sealed Particulars (AHSP) of this document and any query pertaining to this should be reverted to him only.

0.4 This is a restricted document and therefore should not be communicated to any one who is not authorised to receive it.

0.5 Any deviation from this specification will not be resorted to/done without the written sanction of Inspection Authority, i.e. Controllerate of Quality Assurance Engg Eqp't, Aundh Camp, Pune -411 027.

0.6 Stores must conform in all respect with this specification and other particulars /Appendices/Test Schedule/drawing attached to it.

0.7 Nothing shall relieve the manufacturer of his responsibility for safe custody of this specification, drawing and paper particulars issued to him for particular contract till the contract is completed.

0.8 Unauthorized departure from this specification and drawing may involve rejection of bad components/parts which will be inspected during stage inspection and after complete manufacture, will be supplied to testing for final approval of Inspecting Officer before despatch to consignee.

0.9 Upon issue of amendment and new drawings introducing modifications and alterations to design, the contractor will incorporate such change into current production within a period to be accorded upon by DGQA or his

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authorised agent and the contractor. The drawing governing the design of the body required will only be specified by the purchaser.

0.10 Sub contracting of the equipment can be done only with written sanction of QA authority. A fact that permission has been granted for sub-contracting does not absolve the main contractor of his contractual obligations. Thus, the main manufacturer shall submit the details of sub-contracts, if any, of the assembly/sub-assembly to QA authority. This shall include the details of sub-contract along with his address and drawing No.

0.11 This specification has been specifically prepared to cater for Winder Tape, 1A.

0.12 The manufacturer shall extend to QA authority or his authorised representative, free of cost all reasonable facilities for inspection and testing of equipment including inspection gauges. If required or felt by QA authority, stage inspection will also be carried out.

0.13 Copies of the specification can be obtained from Controllerate of quality Assurance Engg Eqpt, Aundh Camp, Pune-411 027 on payment (as per latest rate) by way of crossed demand draft payable to Controller, CQAE, Aundh Camp, Pune-411 027 or by crossed Indian Postal Order drawn in favour of The Controller, CQAE Aundh Pune- 411027, payable at the post office of GPO Pune-411001.

1. SCOPE AND END USE

1.1 This specification covers the general and technical requirement. Material, manufacture, fabrication and quality assurance inspection including test and performance of Winder Tape, 1A, intended for Defence service use. The main function of winder tape is winding of mine tape. It is used for laying and recovery of mine tape during mine field task.

2. RELATED SPECIFICATION, DRAWING AND DOCUMENTS

2.1 All related specification/ drawings mentioned below shall be on the date. The following specification and standards have been consulted while preparing this Defence Specification:-

IS:5 - Colours for ready mix paints and enamels.

IS:205 - Non Ferrous metal butt Hinges,

IS:2062 - Steel for general structural purposes.

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- IS:228(Pt II) - Method of chemical analysis of steels.
- IS:410 - Cold rolled brass sheet, strip and foil.
- IS:451 - Technical supply conditions for wood screws.
- IS:723 - Steel countersunk head wire nails.
- IS:2673 - Dimensions for wrought Al and Al alloys extruded round tube.
- IS:1608 - Mechanical testing of Metals - Tensile testing.
- IS:1732 - Dimension for round and square steel bars for structural and general engineering purposes.
- IS:1852 - Rolling and cutting tolerances for hot rolled steel products.
- IS:2500 (Part I) - Sampling inspection tables, inspection by attributes and count of defects.
- IS:2500 (Pt II) - Sampling inspection tables, inspection by variables for percent defective.
- IS:2507 - Cold rolled steel strips for springs.
- IS:3685 - Method of chemical analysis of brasses
- IS:4084 - Eyelets and washers.
- IS:4274 - Buckles.
- IS:4572 - Polyamide multifilament ropes general requirement for hawser-laid and plaited.
- IS:4727 - Nylon webbing for aeronautical purposes,
- IS:4905 - Method for random sampling.
- IS:5872 - Cold rolled strips (box strappings).
- IS:2393 - Cylindrical pins.
- IS:7777 - Cotton webbing rolled edges.

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- IS:7173 - Slotted pan head tapping screws.
- IS: 733 - Wrought Al & Al alloy bars, rods and sections.
- IS : 738 - Wrought Al alloys , drawn tube for general Engg purposes.
- IS:6662 - Specification for timber species suitable for wooden packaging.
- IS:304 - High Tensile Brass Ingots and castings.
- IS:5370 - Plain washers with outside dia 3 x inside dia.
- IS:363 - Hasps and staples.
- IS:6101 - Slotted pan head screw,
- IS:6760 - Slotted countersunk head wood screws.
- IS:7071 (Pt 1)- Method of physical testing for ropes and cordages.
- IS:10106 (Pt 3/Sec 3) - Packaging code, Ancillary materials tensional
Strapping.
- BS:2782(Pt3)(320E)- Method of testing for tensile strength
elongation, and elastic modulus of FRP.
- BS:2782(Pt3)(335A)- Method of determination of flexural properties of rigid
material.
- BS:2782 (Pt 3) 350 - Method of determination of izod
impact strength of rigid material.
- BS:2782 (Pt 3) 359 - Method of determination of charpy
impact strength of rigid material.
- BS:5734 (pt I) - Method of testing of glass content, thermal endurance etc.
- IS:6746 - Unsaturated polyester Resin systems.
- IS:2553 (pt I) - Specification for safety glass.
- BS:3496 -E Glass Fibre chopped strand mat for the reinforcement of
polyester resin system.

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2.2 The following drawings for the supply are to be referred:-

IM:0610/B (sheet 1 of 4) - Winder Tape, 1 A (assembly).

IM:0610/B (sheet 2 of 4) - Winder Tape, 1 A (details).

IM:0610/B (sheet 3 of 4) - Winder Tape, 1 A (details, brass item)

IM:0610/B (sheet 4 of 4) - Packing box for 4 Nos of Winder Tape, 1 A.

2.3 Notes :-

2.3.1 Indian Standard specifications are obtainable from Bureau of Indian Standard, Manak Bhavan, 9 Bahadurshah Zafar Marg, New Delhi or through their regional office.

2.3.2 British Standard specifications are obtainable from Book Supply Bureau, D-44, South Extension-I, New Delhi-110049,

2.3.3 Copies of drawings are obtainable from Controller, CQAE, Aundh Camp, Pune-411 027 on hire on payment (Non-refundable).

2.3.4 Use of above listed drawing is mandatory in manufacture of Winder Tape, 1 A,

2.3.5 Reference to this specification to any Indian standards or any other specification, drawings in any tender enquires, A/T, S/O means current on the date of such tender or contract.

03. DESCRIPTION

Winder Tape, 1 A is used for laying and recovery of mine tape during mine field tasks. It consists of an assembly of two discs made of fibre glass chemical fixed on centre two piece aluminium alloy tube with a disc on either end. This disc assy is mounted on specially shaped body, also made of fibre glass. The central two piece tube is connected together with the help of steel socket. The socket is fixed with piece of tube on one side and on other end threaded insert is provided, so that the other tube piece with the disc can be connected to it. Two nylon bushes should be mounted on the fibre glass body for smooth rotation of disc assy. Three axial slots are also provided on the tube for insertion of tape and during rewinding of mine tape. A slot is provided on one end of tube to insert the detachable handle for winding operation. A provision is made for housing the handle on the body during the laying operation. A standard web

belt and nylon web are provided for strapping the winder tape on the waist and slinging it on shoulder respectively, during laying and recovery operation of mine tape. A packing box is provided to accommodate four Nos Winder Tape for transportation/ storage purpose.

4. MATERIAL AND TEST REQUIREMENT

Material used in the manufacture of Winder Tape, 1A and various tests that are required to be conducted for material are as follows:-

4.1 Fibre Glass: Main body and spool disc of winder tape shall be of fibre glass reinforced plastic (FRP) using Woven Rowing and/or chopped strand mat to specification BS : 3496 and polyester resin system for low pressure FRP to specification IS:6746. Safety glass should conform to specification IS : 2553. The design of mould is the responsibility of the manufacturer. However, the main body as well as spool disc should be made using single integrated one piece moulding method and no mechanical joints are allowed in order to ensure strength aspect as well to meet user's requirement. The mechanical and other properties should preferably be as per table given below or better quality of material also is acceptable. Colour pigment or matter used for compounding shall be Olive Green of shade ISC 294 to IS : 5 :-

Sl No	Properties	Test method	Units	Value
1.	Reinforcement glass in the form of woven rowing or chopped strand mat (CSM).	BS : 5734(Pt 1) Method 2.	%	25 (min)
2.	Tensile strength	BS:2782-320E DIN EN 61	Kg/cm sq Kg/cm sq	750 600
3.	Flexural strength	BS:2782-Pt-3, 335A (ISO 178 1993(E) DIN EN 62	Kg/cm sq Kg/cm sq	1500 1300
4.	Impact strength	BS : 2782-Pt 3	Kg m	1.3 - 1.8
	a) Izod Notched	Method 350 1993 (ISO:180:1993) BS :		
	b) Charpy unnotched	2782 -Pt3 Method 359 1993 (ISO:179:1993(E)	Kg/cm sq	50
5.	Water absorption	ASTM D 570 6.1	%	0.2 max.

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4.2 Aluminium Alloy : Aluminium alloy extruded round tube conforming to 64430 (HT 30) designation to IS : 1285 having OD as 20 mm and wall thickness as 3.55 mm with a tolerance of 0.94mm as per IS : 2673/1979 shall be used. Chemical composition and mechanical properties shall be conforming to table 1 and 2 of IS : 738-1977.

4.3 Mild Steel Round : The mild steel round used for manufacture of tube connector and handle shall conform to IS:1732 for dimension and IS : 1852 for tolerance. The material shall be steel grade A (Fe 410WA) as per IS : 2062 when tested in accordance with IS : 228 for chemical analysis, IS-1599 for bend test and IS:1608 for tensile tests.

4.4 Aluminium Alloy round : is used for making handle, the raw material of which should conform to designation 64430 (HE 30 Grade) WP condition and shall be of 12 dia conforming to IS : 733/1993.

4.5 Cold Rolled Spring Steel : Spring steel strip used for manufacture of locking strips shall conform to grade 45C8 to IS : 2507 for chemical and mechanical properties when tested in accordance with IS:228 and IS : 1608 respectively.

4.6 Nylon Bushing : Bushing shall be made by injection moulding process or by machining method using nylon 6 or 66 conforming to physical and mechanical properties as per table given below

Sl No.	Properties of nylon moulding and extrusion materials	
	Type 66(Gp)	Type 6(Gp)
1. Melting point	258 to 268 Deg C	220 to 230 Deg C
2. Density at 23 Deg C	1.14 ± 0.01	1.13 ± 0.01
3. Tensile stress at yield	76 MPa	62 MPa
4. Elongation at break	40	100% (max)

4.7 Buckle Brass : Used on shoulder strap shall be of Quick release type conforming to IS : 4274. The material shall be of Brass sheet grade CuZn-37 hard condition to IS : 410.

4.8 Clip End Strap : The clip end strap brass 25 mm used on shoulder strap shall conform to drawing No IM-0610/B (sheet 3 of 4)

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4.9 Webbing Belt : Used in the winder tape shall be Olive Green colour scamic, 57 mm width rolled edges slotted back conforming to specification No IS : 7777. Hook brass with tie slide brass, and buckle brass, male and female shall be as per drawing No IM-0610/B(sheet 3 of 4)

4.10 Nylon Shoulder Webbing : Shoulder strap used in the assembly should be of Nylon Webbing OG colour, 25 mm width type II variety conforming to IS : 4727 and having minimum breaking strength of 300 Kgf.

4.11 Wood Screw : The steel wood screw to fix the handle guide in packing box shall conform to IS:451 in material and construction. They shall be finished in self colour and fully meet the all requirements as specified in IS : 451. The wood screws shall be of slotted counter sunk head type conforming to IS : 6760 in dimension and tolerance.

4.12 Slotted Pan head screw and self retaining Nut : Slotted pan head screws used on winder tape for fixing of shoulder strap, nylon bush and webbing belt shall conform to IS:6101 and shall be made from steel with self locking Nylon nut.

4.13 All plain washers, slotted pan head screws and nuts shall be hot dip galvanized upto 12 microns (max) coating thickness.

4.14 Plain Washers : The washers used under the slotted pan head screws, shall be of steel conforming to IS : 5370 for manufacture, workmanship, finished dimensions including tolerance etc.

4.15 Slotted Pan Head Tapping Screws : Slotted pan head tapping screws wherever used shall conform to IS:7173 and shall be made from steel.

4.16 Cylindrical pin for handle and pipe : This shall conform to IS : 2393 and shall be made from steel.

4.17 Timber for packing box and Handle Grip : The timber species used for packing box for packing of winder tape 1A and Hand Grip shall be of any one of the timber species given under Group III of IS : 6662. Only one type of timber shall be used in manufacture of box. The timber shall be seasoned to a moisture content of not exceeding 15% and shall be free from pith, insect attack, rot, objectionable knots, warping, splits and pin holes of powder post beetles.

4.18 Steel counter sunk head wire nails : Counter sunk head nails used in a construction of box packing winder tape 1A shall be conform to

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IS:723, for material, bend test, dimension including tolerance. Nails shall be plain finish uniformly circular in section, straight, free from wasters and end shall be sharp and pointed. The head of nail shall be properly formed chequered and concentric with the shank.

4.19 Polyamide Multifilament Rope : The rope used for carrying handles of box packing winder tape shall be of 3 strand, hawser laid rope Olive Green in colour conforming to IS : 4572 (Pt I) and (Pt II) in manufacture and other requirements. It shall be of 10 mm dia with linear density of 10 K tex and breaking load of 20.4 kN when tested in accordance with IS : 7071 (Pt II) and IS : 4572 (Pt I) respectively. Polyamide Multifilament Rope of white colour may be supplied instead of olive green.

5. MANUFACTURE AND FABRICATION

5.1 Disc Assembly : The fibre glass shall be free from wrinkles, blisters and cracks. The discs shall give uniform and smooth appearance inside and outside and will be free from defects such as scratches, dents, inclusions and discoloration preferably. These will be manufactured as per details given at para 04.1 of this specification. It will be ensured that proper distribution of fibre upto the edge of discs achieved, in addition edge of the disc is finished smooth and fine in the moulding itself. The colour shade of the disc shall be Olive Green standard colour ISC-294 to IS : 5. The aluminium alloy tube shall be as per dimension indicated in the drawing No IM-0610/B (sheet 2 of 4). The thread of the socket inside the tube and the slots in the central tube shall be smooth and free from burrs and sharp edges. The fibre glass discs shall be fixed chemically on the central tube firmly. The disc shall not come out or loosen during laying/winding operation of the winder tape. Additional hexagonal nuts and bolts of size M4 x 40 will be provided as shown in drawing IM-0610/B (sheet 2 of 4) to hold discs in the place.

5.2 Fibre Glass body : The body shall be manufactured as per dimensions, tolerance as mentioned in the drawing No IM-0610/B (sheet 2 of 4). The body shall be preferably of single piece construction. The fibre glass shall be uniform and smooth finish in appearance. It shall be free from wrinkles, blisters and cracks. It shall be made of FRP as per para 4.1 of this specification. It shall be free from other defects, such as scratches, dents, inclusions and discoloration etc. The equipment shall meet the mechanical and chemical properties as mentioned in par 4.1. above.

5.3 Wooden Box Packing : The manufacture of packing box shall be as per drawing NO IM-0610/B (sheet 4 of 4). Each wooden box with FOUR WINDER TAPE, 1A, should be strapped as per IS:10106 (Pt III), section 3 with cold rolled hot/ rolled steel strap conforming IS:5872. The two

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ends of strapping are brought together and secured by a seal, clip or fasteners. The strap should normally be applied at right angle to the edge of packing box. The strapping should be applied sufficiently tight to ensure that they perform, their function effectively. The edge of polyamide multifilament rope shall be heat set, so that rope strand do not come out. All the frame members shall be of even thickness, rectangular section, trimmed square at ends and reasonably smooth. Nails shall be driven without splitting the frame members and weakening the joints in staggered rows to make a strong box surface shall be treated with copper naphthanate saltuion with two per cent copper by brushing/spraying.

6. IDENTIFICATION AND MARKING

6.1 Winder Tape 1A : Each winder tape, 1A shall be provided with identification plate of anodized aluminum sheet 0.5 mm thick of size 80 x 35 permanently fixed to body of winder tape by means of araldite as shown in the drawing. The identification plate shall be clearly and legibly screen printed/embossed with nomenclature, cat/part No, batch No, month, year of manufacture and firm's name or trademark, using appropriate size character/ numerical. Apart from these on the disc assy, on both the discs above said information shall be screen printed /stenciled using 5 mm size character/ numerical in white paint (see for example the details):-

Details (body)	Screen printed/stenciled (disc)
-----	-----
WINDER TAPE, 1A	Winder Tape 1A
DS CAT/PART NO WB/1095	wB/1095-000545 ABC & Co
-000545	
Manufactured by firm	A/T, S/O No xyz
ABC & Co against A/T. S/O	May 91, batch No 002
NO. XYZ in month, year,	
batch NO	

7. PRE INSPECTION BY MANUFACTURER

The manufacturer shall carry out a thorough pre-inspection of each lot/delivery to ensure that the winder tape and packing case fully conform to the specification and drawing in every respect. A certificate and detailed report to this effect on approved check sheet to include material tests results/certificate/ dimensional details and performance tests details as stipulated in this specification and drawing shall be submitted by the manufacturer while tendering the bulk stores for

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inspection. If pre-inspection of lot as required has not been carried out by the manufacturer, the lot is liable for rejection.

8. PACKAGING

8.1 In order to ensure that the winder tape 1A reach the consignee in perfect and serviceable condition and fit for use, proper packing of winder tape, 1A is necessary.

8.2 Only those Winder Tape, 1A having acceptance inspection mark shall be packed. Before packing the winder tape, their completion shall be ensured and seen that they are in clean and dry state.

8.3 On each box packing winder tape, following information shall be stenciled in black paint with 10 mm high characters /numerical :-

- Description of contents with DS cat/part No.
- Quantity in each box and weight.
- AT/SO reference.
- Firm's name /monogram.
- Consignee's address.
- Inspection note No and date.

9. PERFORMANCE AND DROP TESTS OF WINDER TAPE 1A AND ROLLING TEST OF BOX PACKING

9.1 Performance Trials : Performance trials of winder tape 1A, i.e. laying/rewinding of mine tape shall be carried out THREE TIMES over normal unprepared ground (the mine tape 91.4 m can be obtained on payment through source from CQAE). For this, winder tapes are selected at random as per sampling plan. On these, the mine tape roll (3 Nos) shall be inserted by unscrewing the aluminium alloy tube of disc assy. This disc assy with mine tape shall be then mounted on Fibre Glass Body and tried one after another for laying operation. The fitment/locking of disc assy on the fibre glass body shall be smooth and free from trouble. These tapes after laying shall be rewound on the disc assy. For this one end of mine tape shall be inserted in the slot provided on the tube and rewinding done. The disc assy shall freely/easily rotate on the body. Rewinding the mine tape on the disc assy shall be free and smooth.

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9.2 It should be ensured that steel cross pin/item No 25 of drawing IM-0610/B sheet 2 of 4 fitted in Al Alloy rod of handle of item No 10 of sheet 1 of 4 does not become loose during operation.

9.3 Rolling Test for Box Packing : In order to ensure sound construction and rigidity of box packing the box duly packed with Four winder Tape shall be rolled over a distance of 5 meter at the end of rolling test the Box shall not show any sign of damage.

10. GENERAL REQUIREMENT

Notwithstanding the requirement listed above, the manufacturer shall ensure that the winder tape under supply fully conforms to contract specification and other requirement in terms of manufacture, workmanship, finish and packing.

11. QUALITY ASSURANCE INSPECTION : ADVANCE SAMPLE

The Inspection (Quality Assurance) Authority for winder tape being inspected as per this specification shall be the Controller, CQAE, Aundh Camp, Pune-411 027. The quality assurance is conducted in following stages :-

11.1 On conclusion of supply order/Acceptance of Tender, the firm shall, if so indicated in the S/O and A/T, submit four advance samples of winder tape 1A, unit of acceptable quality as specified in the specification and drawing duly packed in a packing box as per drawing IM-0610/B (sheet 4 of 4), to Controller, CQAE, Aundh Camp, Pune-411 027, along with complete pre-inspection report, test results of all raw materials including fibre glass, for detailed tests, scrutiny and approval. List of raw materials as per clause No 4 of this specification are required alongwith Pilot/ Advance sample.

- | | |
|---------------------------------|----------|
| a) Fibre glass(FRP) | -3 Nos. |
| Size : 250mm x 250mm | |
| b) Al alloy Rod 500 mm long | - 3 Nos. |
| c) Al alloy Tube 500 mm long | - 3 Nos. |
| d) M S Round as per IS: 1608 | - 3 Nos. |
| e) Spring steel as per IS: 1608 | - 3 Nos. |
| f) Nylon Bush | - 3 Nos. |
| g) Polyamide multifilament Rope | - 10m |
| h) Web Belt OG Seamic | - 10 m |
| i) Nylon shoulder webbing | - 10m |

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j) Wooden pieces for Box packing - 3 Nos.

11.2 Pre-inspection report shall be in the form of check sheet.

11.3 The detailed checks and performance tests shall take approximately, 6 to 8 weeks from the date of receipt of advance sample, unless otherwise separately stated in the order/A.T.

11.4 The Advance samples are likely to be subjected to destructive tests, if considered necessary of quality of material and other constructional details.

11.5 The advance sample on the technical acceptance may have to be retained for guidance at the place of bulk inspection till the bulk supply is completed and likely to be permitted for despatch only on instruction of SQAQ/ QAO.

11.6 Each of the components of winder tape shall be subjected to dimensional check as per relevant drawings. The chemical and mechanical property of all the components shall be checked. The packing and other details checked as stipulated in this specification. The winder tape and box packing shall also be subjected to performance and drop/road testing.

11.7 During evaluation of advance sample, certain minor changes, if required, will be carried out by the manufacturer free of cost and without any financial effect.

11.8 Bulk production of winder tape shall be permitted only if the advance sample are found conforming to specification in all respect.

12. BULK SUPPLIES (QUALITY ASSURANCE INSPECTION)

The bulk production inspection (quality assurance) shall be performed by the inspection officer (SQAQ) as indicated in the Supply Order/Acceptance of Tender (A.T.) at manufacturer's premises as declared in the Supply Order/A.T. On acceptance of advance sample by the Controller, CQAE, the bulk production inspection (quality assurance shall be conducted in the following stages :-

12.1 Pre-inspection Report of Manufacturers : It is mandatory on the part of manufacturer that before tendering the bulk for quality assurance inspection as clause 7 of this specification.

12.2 Quality Assurance of Raw Material - All raw material such as fibre glass, Aluminium Alloy tube, bars, spring steel, timber, nylon webbing, nylon webbing belt, polyamide multifilament ropes and hardware such as nails, wood screw, pan head screws and turn over washers shall be drawn by the Senior Quality Assurance Officer of the area concerned or his authorised representative, from raw material manufacturer's premises and tested in DGQA laboratories only. The firm should use approved raw material duly approved by SQAQ, SQAQ(E) of the area concerned in bulk production.

12.3 The Bulk Production Inspection (Quality Assurance) : shall be performed strictly as per the inspection process and test schedule No CQAE/TS/1494 by the inspecting officer/QAE/Inspection staff.

13 LITERATURE

13.1 The draft literature for the item can be obtained from CQAE, Aundh Camp, Pune-411 027. Three copies of draft literature i.e. User Hand Book and Identification List each shall be forwarded duly printed to CQAE, Aundh Camp, Pune-411 027 for approval. On approval of draft literature, the firm shall print it and supply along with the store.

13.2 The number of copies of User Hand Book and Identification Part List covers the operation of equipment, shall be supplied by the firm as indicated in the supply order/Acceptance of Tender to the consignee as per approved format.

13.3 In addition to the above, four copies of printed literature, shall be supplied to the controller, CQAE, Aundh Camp, Pune-411 027 duly approved by Inspection Officer. The number of copies of User Hand Book(UHB) and Identification Part List (IPL) covers the operation of equipment shall be supplied by the firm at the rate of One set (UHB and IPL separately) per four Nos of Winder Tape, 1A OR as indicated in the Supply Order/ Acceptance of Tender to the Consignee as per approved format. Literature (UHB and IPL separately) should be in Bilingual (i.e. Hindi and English). All photographs should be coloured.

14. WARRANTY

Each lot of winder tape supplied against the order shall be deemed to bear warranty of the contractor against all defects, in material, workmanship, finish and performance for a period of 12 months from the date of receipt of stores at consignee depot. If during this period, the

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stores supplied are found by the consignee to be defective, the purchaser shall be entitled to call upon the stores, immediately within such a period as may be fixed by the purchaser/ inspection authority for the purpose. The stores so replaced/rectified shall be deemed to bear warranty period as mentioned above, from the date of replacement/rectification. If any of the portion of the stores are consumed, the contractor will also be liable to compensate the purchaser in the form of price reduction for stores so consumed, such price reduction being decided by the purchase officer.

15. SUGGESTION FOR IMPROVEMENT

If the users of this specification find any need for improvement/ amendment from technical/commercial view point, they may communicate their suggestion in writing to the Controller, CQAE, Aundh Camp Pune -411 027.

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TEST SCHEDULEQUALITY ASSURANCE ACCEPTANCE PROCESS AND TEST SCHEDULE
FOR BULK INSPECTION OF WINDER TAPE, 1AGENERAL

01. This quality assurance acceptance process and test schedule lays down the quality assurance acceptance checks, tests and performance requirement of winder tape, 1A.
02. This test schedule is issued to guide the manufacturer on the inspection process and tests. Nothing in this schedule absolves the manufacturer his responsibility to ensure that the quality assurance requirement are met with strictly as per the terms and conditions of contract and items supplied are upto the requirement of the contract specification, contract agreement and advance sample sentencing report.
03. During the application of the schedule, if it is found that further aspects should advantageously be included in this schedule, such aspects should be brought to the notice of the Controller, CQAE, Aundh Camp, Pune-411 027.
04. For proper conduct of checks/tests, it is necessary that all the relevant standards, specification are studied properly, test/recording procedure and computation of test results are properly understood. Detailed quality assurance check sheet for various checks and tests and their systematic recording shall be prepared by the manufacturer and got approved before its use. The pre-inspection report to be submitted by the firm along with each inspection call letter during bulk supply of winder tape, 1A shall be on these format.
05. The manufacturer of winder tape, 1A, shall extend to the inspection authority, i.e, Controller, CQAE or his authorised representative/inspection officer (SQAQ) and inspection staff free of cost all assistance including the reasonable test facilities like laboratory for testing of chemical composition, hardness, tensile properties, performance test of winder tape, 1A and packing box. The manufacturer shall produce on demand or shall arrange all measuring and tests instruments and labour requirement, if any, for handling of winder tape, 1A. He shall arrange proper lighting and ventilation arrangement and inspection bay, so as to give reasonable, comfortable working condition to the Quality Assurance/staff for the checks/tests.

**DOCUMENTS AND ITEMS TO BE REFERRED DURING QUALITY ASSURANCE
PROCESS, TEST AND INSPECTION**

06. Following inspection, drawing shall be referred for guidance and further details :-

6.1 Specification No CQAE/1095/1616 and drawing No IM-0610/B and its connected drawings.

6.2 Advance sample report relevant to Winder Tape, 1A under inspection (to be supplied separately after advance sample inspection).

6.3 IS:4905 - Method of random sampling,

6.4 IS:2500(Part I) - Sampling inspection tables, inspection by attributes by count of defects.

6.5 IS:2500 (Part II) - Sampling inspection tables, inspection by variables or percent defects.

RANDOM SAMPLING METHOD AND SAMPLING PLANS

07. The samples of various materials including packing of Winder Tape, 1A to be drawn for various tests, performance tests, trial shall be at random, without regard to their quality as described, in IS : 4905. The sample so drawn shall be serially numbered and clearly marked for early identification at later date. The number of samples to be drawn to meet sample size (number of units or product in the sample) shall be as per various sampling plans given below:-

7.1 Single sampling Variable Plan for variability, unknown Standard Deviation method or range method

These plans shall be adopted for testing and inspection of various critical and major material properties/parameters, performance test and trials of Winder Tape, 1A. The sentencing of material for their conformance to various chemical, mechanical and other requirement of specification and performance trials / tests requirement stated in the specification shall be based on relevant calculation as described in IS:2500 (Pt II), adopting AQL 4 % for critical parameters and 6.5 % for the major parameters. The sample size based on the inspection level II shall be as given below for various lot sizes.

Lot size	Sample size
51 - 150	3
151 - 300	4
301 - 500	5
501 - 1000	7
1001 - 3000	10
3001 - 10000	15

Note : The minimum size of the lot to be offered for inspection shall be 51 Nos and above.

7.2 Double sampling Inspection Plan by Attributes and count of defects These sampling plans shall be adopted for inspection of various major and minor properties/parameters of various specification requirements. Sentencing of the sample and the lot shall be as per double sampling plan at table 3 and procedure described in IS : 2500 (Part I). The number of defective components of Winder Tape, 1A and packaging are considered either for acceptance or rejection. In case the total number of defective in the sample size exceed the acceptance number, the lot shall be rejected. The sample size, AQL for various class of defects/parameters, acceptance No (AN) and Rejection No (RN) based on general inspection level I, table III A or IS : 2500(Pt I) for various lot sizes shall be as given below:-

Lot size	Sample F-first S-second	Sample size Insp. level	Cumula- tive sample size	AQL			
				Major 6.5%		Minor 10%	
				AN	RN	AN	RN
51 - 90	F	3	3	0	0	0	2
	S	3	6	0	0	1	2
91 -150	F	5	5	0	2	0	3
	S	5	10	1	2	3	4
151-280	F	8	8	0	3	1	4
	S	8	16	3	4	4	5
281-500	F	13	13	1	4	2	5

Ah

	S	13	16	4	5	6	7
501-1200	F	20	20	2	5	3	7
	S	20	40	6	7	8	9
1201-3200	F	32	32	3	7	5	9
	S	32	64	8	9	12	13
3201-10000	F	50	50	5	9	7	11
	S	50	100	12	13	18	19

Note: The minimum size of the lot to be offered for inspection shall be 51 Nos and above.

CLASSIFICATION OF DEFECTS/PARAMETERS

08. Non-conformance of Winder Tape, 1A and packing box to the specified requirements are classified into the following :-

8.1 Critical defects/parameters Non-conformance of material like fibre glass moulding materials for body and disc. Aluminium alloy tube and round, cold rolled spring steel, nylon bushing, nylon webbing belt and multifilament rope. Non-conformance of Winder Tape, 1A in laying/recovery operation and all other parameters which results in affecting serviceability, performance or the technical, function and durability are classified as critical parameters.

8.2 Major Defect/Parameters: Non-conformance of stores/ material like handle, nails, wood screw, turn over washer and buckle brass to the specification requirement. Non-conformance of quantity in the packing box and its performance in rolled test, non-conformance of dimensional requirement of various components and identification plate on Winder Tape, 1A, workmanship, finish to the specification requirement and all other such parameters / defects that are likely to result in failure or reduce materially the usability, serviceability for its intended purpose are classified as major defects/parameters.

8.3 Minor Defects/Parameters: Non-conformance of marking on packing box, marking on disc assy, inadequacy in construction of packing box are classified as minor defects.

**PRE-PRODUCTION TESTING OF RAW MATERIALS AND ITEMS**

09. The manufacturer of Winder Tape, 1A may offer all the raw materials such as fibre glass, spring steel, timber, nylon webbing, webbing belt, polyamide multifilament rope, nylon 6 or 66, wire nails, wood screw and turn over washer under stage inspection call letter, along with pre-inspection, test report, prior to commencement of bulk production. The samples of raw material / items shall be drawn at random as per sampling plan indicated at 07.1 above and tests conducted at DGQA laboratories only.

EXAMINATION OF MANUFACTURERS PRE-INSPECTION REPORT

10. The manufacturer of Winder Tape, 1A along with bulk inspection call letter, shall produce his pre-inspection report indicating the total quantity offered packed in packing box. The pre-inspection report shall be on the approved check sheet and shall include complete dimensional check, recordings of various components material test reports and performance/drop test of Winder tape, 1A and rolled test of packing box. In case, pre-inspection report is not submitted or found to be incomplete, the inspection call letter shall be disposed off indicating the reason.

INITIAL VISUAL INSPECTION

11. In case firm's inspection call letter is found acceptable before proceeding with detailed inspection, initial visual inspection of the lot offered shall be carried out. This will include counting of total quantity, completeness, general finish, identification marking. In case, no discrepancies are observed in the lot offered, further inspection shall be continued.

TESTING OF MATERIAL FROM FINISHED PRODUCT

12. In case during the initial visual inspection, no discrepancies are observed, sample of various material shall be drawn at random as per sampling plan indicated at para 7.1 above. These shall be subjected to various tests. Till the test results are obtained, the complete lot offered shall be bonded and kept under properly sealed/locked condition in a bond room. In case the material samples qualify in the test, further inspection shall be performed, otherwise the lot shall be rejected by affixing Rejection Inspection mark on all the product and rejection inspection note issued and if need be the rejected lot segregated and kept under bonded condition in a bond room.

A12

**FINAL INSPECTION OF WINDER TAPE, 1A FOR DIMENSION, WORKMAN-SHIP,
PERFORMANCE, FINISH, PERFORMANCE OF PACKING BOX AND
IDENTIFICATION MARKING DETAILS**

13. In case the components qualify the material tests as specified in the specification before proceeding with further inspection, the bonded seal shall be examined and its condition checked. In case of any evidence or tampering, the lot shall be sentenced as rejected and Rejection Inspection Note issued indicating the reason for rejection. In case of no discrepancies the sample of Winder Tape, 1A along with packing box shall be drawn at random to meet the sample size as per sampling plan indicated at 7.1 above. The sample shall then be subjected to detailed check for quantity in the packing box, weight, roll test of packing box with content, performance/ of Winder Tape, 1A. In case samples fail to qualify in the tests, further inspection shall be suspended and stores rejected and rejection inspection note issued indicating the reason. In case no discrepancies are found, further sample of Winder Tape, 1A and packing box shall be drawn at random to meet the sample size as per sampling plan indicated at para 7.2 above. The sample shall then be subjected to detailed inspection for dimension and all other requirements including identification marking and packaging requirement as specified in the specification. In case samples fail to qualify during first sampling, second sample as indicated in sampling plan shall be drawn and checked for all the requirements. In case the samples qualify in all respect of the final inspection, the lot shall be stamped with acceptance inspection mark (rubber) in indelible ink/paint as indicated in the drawing. The location of inspection mark shall be indicated in the remarks column of the inspection note. In case the samples fail to qualify, the lot shall be rejected and action taken as already described above.

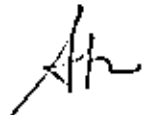
**RELEASE OF WINDER TAPE, 1A FOR DESPATCH AND QUALITY ASSURANCE
RECORD**

14. Following procedure to be followed before release for dispatch :-

14.1 The entire lot of Winder Tape, 1A, offered for inspection is also liable for second and third tier inspection by the Inspecting Officer.

14.2 Before releasing the Winder Tape, 1A, for despatch, it should be ensured that packing is complete.

14.3 While issuing inspection note, it should be ensured that under remark column complete details about the manner/and means/place of stamping of acceptance mark on the product shall be indicated along

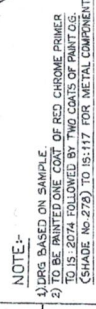


with number of packing box and quantity of winder tape in each packing box.

14.4 A complete record of inspection report of check sheet including test results/reports shall be maintained systematically for future record and audit by inspection authority (CQAE).

14	15	16	17	18	19	20	21	22

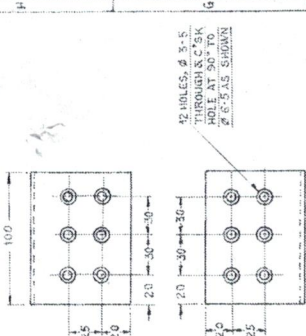
NOTE:-
 1) DPG BASED ON SAMPLE
 2) TO BE PRINTED ONE COAT OF RED CH
 TO IS: 2074 FOLLOWED BY TWO COAT
 (SHADE No 272) TO IS:117 FOR M



VIEW FROM ARROW 'X'

PART LIST																																			
DO NOT SCALE SCALE: 1:2																																			
DIMENSIONS ARE IN MM.																																			
UNLESS OTHERWISE SPECIFIED																																			
ALL SURFACES AND CORNERS																																			
TO BE ROUNDED OFF																																			
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IM-0610																																			
SHEET 1 OF 4																																			
CONTROL LRAIF DE QUALITY ASSURANCE (ENGG. POFT)																																			
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12	11	10	9	8	7	6	5	4	3	2	1																								
<div>DRN</div> <div>MDA: SHAN-4</div> <div>TCD</div> <div>CHKO</div> <div>ISO 9000</div> <div>ISO 9001</div> <div>ISO 9002</div> <div>ISO 9003</div> <div>ISO 9004</div> <div>ISO 9005</div> <div>ISO 9006</div> <div>ISO 9007</div> <div>ISO 9008</div> <div>ISO 9009</div> <div>ISO 9010</div> <div>ISO 9011</div> <div>ISO 9012</div> <div>ISO 9013</div> <div>ISO 9014</div> <div>ISO 9015</div> <div>ISO 9016</div> <div>ISO 9017</div> <div>ISO 9018</div> <div>ISO 9019</div> <div>ISO 9020</div> <div>ISO 9021</div> <div>ISO 9022</div> <div>ISO 9023</div> <div>ISO 9024</div> <div>ISO 9025</div> <div>ISO 9026</div> <div>ISO 9027</div> <div>ISO 9028</div> <div>ISO 9029</div> <div>ISO 9030</div> <div>ISO 9031</div> <div>ISO 9032</div> <div>ISO 9033</div> <div>ISO 9034</div> <div>ISO 9035</div> <div>ISO 9036</div> <div>ISO 9037</div> <div>ISO 9038</div> <div>ISO 9039</div> <div>ISO 9040</div> <div>ISO 9041</div> <div>ISO 9042</div> <div>ISO 9043</div> <div>ISO 9044</div> <div>ISO 9045</div> <div>ISO 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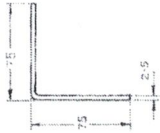
8	7	6	5	4	3	2	1
						<p>IM-0610 (SHEET 3 OF 4)</p>	
<p>BUCKLES, BRASS, MALE 57 mm</p> <p>MATL. BRASS SHEET 2.64 mm THICK OF GRADE CuZn 37 HARD TO IS: 410</p> <p>CAT/PART NO. CN/8315.000016</p>		<p>BUCKLES, BRASS FEMALE 57 mm</p> <p>MATL. BRASS SHEET 2.64 mm THICK OF GRADE CuZn 37 HARD TO IS: 410</p> <p>CAT/PART NO. CN/8315.000017</p>		<p>CLIP, END, STRAP BRASS 25 mm</p> <p>MATL. BRASS SHEET OF 0.56 mm THICK OF GRADE CuZn 37 HARD TO IS: 410</p> <p>CAT/PART NO. CN/8315-000061</p>		<p>IM-0610 (SHEET 3 OF 4)</p>	
				<p>SLIDE BRASS 58 mm.</p> <p>MATL. BRASS SHEET OF 1.22 mm THICK OF GRADE CuZn 37 HARD TO IS: 410.</p> <p>CAT/PART NO. CN/8315-000047.</p>		<p>IM-0610 (SHEET 3 OF 4)</p>	
<p>HOOKS, BRASS, 58 mm WITH TIES</p> <p>MATL. ① BRASS SHEET OF 0.56 mm THICK OF GRADE CuZn 37 HARD TO IS: 410.</p> <p>② BRASS WIRE OF 2.95 mm DIA OF GRADE CuZn 37 HARD DRAWN TO IS: 4413.</p>		<p>WINDER TAPE 1A (DETAILS)</p> <p>DO NOT SCALE</p> <p>SCALE: 1:1</p>		<p>IM-0610 (SHEET 3 OF 4)</p>		<p>IM-0610 (SHEET 3 OF 4)</p>	
<p>ES/WB/220</p> <p>ES/WB/198</p> <p>DC(1) DATE/ZONE</p>		<p>AS IM-0610 (SHEET 1 OF 4) ADVANCED THIS DRG. TO/8.</p> <p>DRG NO. 10610</p> <p>SHEET NO. 1, 2 & 4 ADVANCED AS 'A' DRG NO. ADVANCED TO/8 (CFE)</p>		<p>DRN</p> <p>TCD</p> <p>CHKD</p> <p>PSD</p> <p>APPD</p> <p>DATE</p> <p>TOLERANCE UNLESS OTHERWISE SPECIFIED</p> <p>MEDIUM IS: 2:102</p>		<p>DO NOT SCALE</p> <p>SCALE: 1:1</p> <p>DIMENSIONS ARE IN mm. UNLESS OTHERWISE SPECIFIED.</p> <p>ALL SHARP EDGES AND CORNERS TO BE ROUNDED OFF.</p> <p>PERTAINS TO: IM-0610 (SHEET 1 OF 4) / B</p>	
<p>7</p>		<p>6</p>		<p>5</p>		<p>4</p>	
<p>3</p>		<p>2</p>		<p>1</p>		<p>0</p>	



DETAIL OF ITEM NO. 14

SCALE: 1:2

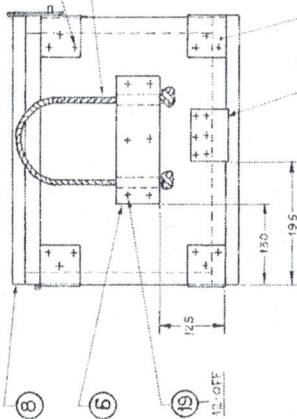
MATL: 100 x 150 x 2.5 TO 15.1750



22-OFF

20

17



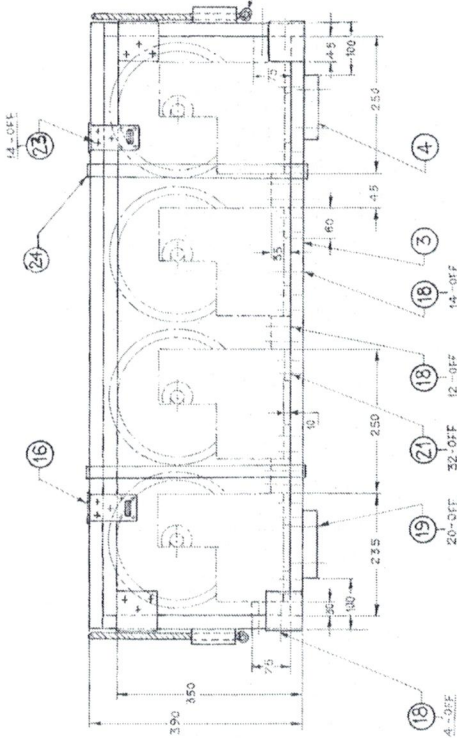
13

14

19

12-OFF

INSERT POLYMER
MULTILAYERED ROPE
AND SUITABLE JOINT
TO BE MADE AT BOTH
ENDS WHEN HEATED



14-OFF

18

12-OFF

20-OFF

32-OFF

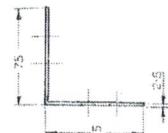
4-OFF



DETAIL OF ITEM NO. 13

SCALE: 1:2

MATL: 75 x 150 x 2.5 TO 15.1750



24-OFF

19

7

15

2

5

22

18

12

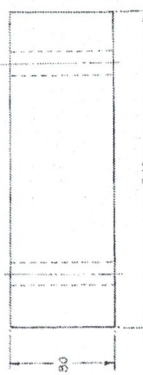
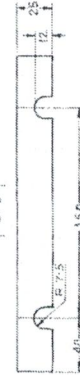
10

11

18

32-OFF

SUITABLE GROOVE
FOR ITEM NO. 13



DETAIL OF ITEM NO. 6

SCALE: 1:2

NOTE: THE TIMBER SPECIES USED FOR
PACKING BOX SHALL BE ANY ONE
OF THE TIMBER SPECIES GIVEN UNDER
GROUP III OF IS: 6682. THE MOISTURE
CONTENT SHALL NOT EXCEED 15%.

BOX SHOWN IN OPEN POSITION

No.	MATL	SIZE	QTY	WT
24	COLD ROLLED STEEL STRIP	AS REQD		
23	WOOD SCREW NO. 5 x 15	14		
22	WOOD SCREW NO. 6 x 15	16		
21	WOOD SCREW NO. 8 x 25	32		
20	WOOD SCREW NO. 8 x 15	72		
19	WOOD SCREW NO. 12 x 35	56		
18	WOOD SCREW NO. 12 x 45	66		
17	POLYMER METAL RING	2		
16	MILD STEEL LAMP GLASS	2		
15	EXTRUDED BRASS RUIT	3		
14	ANGLE BOTTOM	2		
13	ANGLE	8		
12	STRIP WOODEN	600 x 40	19	
11	1 H BLOCK WOODEN	75 x 50 x 90	2	
10	BLOCK WOODEN	40 x 50 x 90	6	
9	PH BLOCK WOODEN	75 x 50 x 90	2	
8	TOP PLANK COVER	1100 x 200 x 20	1	
7	SIDE PLANK COVER	500 x 200 x 20	2	
6	HANDLE	-	2	
5	FRONT AND BACK PLANK COVER	1000 x 200 x 20	2	
4	BOTTOM SUPPORT PLANK	500 x 100 x 20	2	
3	BOTTOM PLANK	500 x 20	1	
2	SIDE PLANK	500 x 20	2	
1	FRONT AND BACK PLANK	1000 x 200 x 20	2	
54	MATL	SIZE	QTY	WT

No.	MATL	SIZE	QTY	WT
24	COLD ROLLED STEEL STRIP	AS REQD		
23	WOOD SCREW NO. 5 x 15	14		
22	WOOD SCREW NO. 6 x 15	16		
21	WOOD SCREW NO. 8 x 25	32		
20	WOOD SCREW NO. 8 x 15	72		
19	WOOD SCREW NO. 12 x 35	56		
18	WOOD SCREW NO. 12 x 45	66		
17	POLYMER METAL RING	2		
16	MILD STEEL LAMP GLASS	2		
15	EXTRUDED BRASS RUIT	3		
14	ANGLE BOTTOM	2		
13	ANGLE	8		
12	STRIP WOODEN	600 x 40	19	
11	1 H BLOCK WOODEN	75 x 50 x 90	2	
10	BLOCK WOODEN	40 x 50 x 90	6	
9	PH BLOCK WOODEN	75 x 50 x 90	2	
8	TOP PLANK COVER	1100 x 200 x 20	1	
7	SIDE PLANK COVER	500 x 200 x 20	2	
6	HANDLE	-	2	
5	FRONT AND BACK PLANK COVER	1000 x 200 x 20	2	
4	BOTTOM SUPPORT PLANK	500 x 100 x 20	2	
3	BOTTOM PLANK	500 x 20	1	
2	SIDE PLANK	500 x 20	2	
1	FRONT AND BACK PLANK	1000 x 200 x 20	2	
54	MATL	SIZE	QTY	WT

No.	MATL	SIZE	QTY	WT
24	COLD ROLLED STEEL STRIP	AS REQD		
23	WOOD SCREW NO. 5 x 15	14		
22	WOOD SCREW NO. 6 x 15	16		
21	WOOD SCREW NO. 8 x 25	32		
20	WOOD SCREW NO. 8 x 15	72		
19	WOOD SCREW NO. 12 x 35	56		
18	WOOD SCREW NO. 12 x 45	66		
17	POLYMER METAL RING	2		
16	MILD STEEL LAMP GLASS	2		
15	EXTRUDED BRASS RUIT	3		
14	ANGLE BOTTOM	2		
13	ANGLE	8		
12	STRIP WOODEN	600 x 40	19	
11	1 H BLOCK WOODEN	75 x 50 x 90	2	
10	BLOCK WOODEN	40 x 50 x 90	6	
9	PH BLOCK WOODEN	75 x 50 x 90	2	
8	TOP PLANK COVER	1100 x 200 x 20	1	
7	SIDE PLANK COVER	500 x 200 x 20	2	
6	HANDLE	-	2	
5	FRONT AND BACK PLANK COVER	1000 x 200 x 20	2	
4	BOTTOM SUPPORT PLANK	500 x 100 x 20	2	
3	BOTTOM PLANK	500 x 20	1	
2	SIDE PLANK	500 x 20	2	
1	FRONT AND BACK PLANK	1000 x 200 x 20	2	
54	MATL	SIZE	QTY	WT

WINDER TAPE 1A

(PACKING BOX FOR 4 NOS)

IM-0610

(SHEET 1 OF 4)